



Sustainable intensification of key farming systems in East and Southern Africa

Introduction

The African Research in Sustainable Intensification for the Next Generation (Africa RISING) comprise three research for-development projects for West Africa, East and Southern Africa, and the Ethiopian highland supported by the United States Agency for International Development as part of the U.S. government's Feed the Future Initiative. Africa RISING in East and Southern Africa is being implemented in Tanzania, Malawi and Zambia.



Farmers discussing field experiments

Project countries:

Tanzania and Malawi and soon, Zambia

Tanzania

Project sites:

The project is being implemented in Babati and Kiteto districts in Manyara region of northern Tanzania and Kongwa district in Dodoma region, central Tanzania (Figure 1). The action sites were selected to acknowledge agroecological differences, allow appropriate targeting of technologies and strategies, and complement the development efforts of another USAID-supported program, the Tanzania Staples Value Chain (NAFAKA) project.

Challenges: The key constraints to agricultural productivity identified in these areas include poor soil fertility, limited access to improved seeds, climate variability, pest and disease infestations, low mechanization, weak linkages between research/extension and farmers, insufficient knowledge about healthy human nutrition, inadequate agro-processing, and poor markets.

For livestock, the challenges include in availability of improved breeds and better pasture and fodder species, overstocking, pests and diseases, conflicts between livestock keepers and farmers, and wildlife - livestock conflict among others.

Africa RISING will, through a participatory approach, prioritize the challenges to address over time, allowing the sequencing and targeting of technologies to continually enhance farm-level outcomes.

Project interventions

Through participatory action research, the project is identifying and pretesting the best management practices for integrating crops, livestock and land management, and linking farming and marketing practices to nutrition and health. These will then be widely disseminated by development partners for scaling up and wider adoption in the project area and beyond to significantly impact on food security, nutrition, farm incomes, and environmental sustainability.

These practices comprise of single technologies or varied combinations of:

- High yielding, disease resistant and drought tolerant, multi-purpose, nutritious and marketable food and feed crops identified through participatory selection. These include maize, beans, pigeon pea, groundnut, and fodder plants.
- Integrated soil fertility management practices such as efficient application of organic and inorganic fertilizers in the farming systems, and/or integration of legumes in the rotation.
- Postharvest processing, utilization, and nutrition technologies to reduce food loss, increase shelf life and market value of farm produce. Special focus is being given to ensure food safety by addressing mycotoxin contamination.
- Appropriate land management technologies that conserve water and soil such as rain water harvesting, rain use efficiency, and controlling soil erosion. Integration of crop and livestock (and poultry) to enhance their productivity through introduction of agroforestry-based interventions for fodder and pasture quality management.



Farmer in Babati, Tanzania, testing maize - climbing bean intercropping

Malawi

Project sites:

The project is being implemented in Ntcheu and Dedza districts in central Malawi where maize-based productions systems are dominant. Agroecological considerations guided the identification of research action sites.

Challenges: Poverty, food insecurity, and malnutrition are common in the area as a result of low agricultural productivity and over-reliance on low-protein staple cereal crops. Constraints to agricultural productivity include inadequate and outdated extension messages, variable rainfall, and degraded soils.

Project interventions

Africa RISING aims to enhance farmers' knowledge and support intensification to increase productivity in maize-legume farming systems, beginning with integrating technologies that address soil and land degradation.

The research in Malawi is coordinated by Michigan State University and builds on its past successes of promoting legume-diversified farming systems in northern Malawi through participatory action research using 'mother-baby' adaptive trials as platforms for knowledge dissemination.

Mother trials: The researchers set up 'mother trials' on lead farmers' fields that demonstrate an array of existing technologies and technology combinations for sustainable intensification. These are:

- Intensified grain legume production as sole crops in rotation with cereals or using various maize/legume intercropping options, and a unique intercropping of two grain legumes based on their complementary growth characteristics and plant architecture. This 'double-up legume' technology hinges on pigeon pea's unique growth habit compared to the potential under-storey companion crops (groundnut, soybean, cowpea, beans), which ensures enhanced soil fertility benefits and grain for better nutrition.
- Soil fertility and soil health management through application of organic, inorganic, or a mixture of both fertilizers, use of cover crops and short fallow rotation with green manure.

Adaptive baby trials: Members of the farmers' groups involved in setting up the mother trials select their preferred

options and set up 'baby trials' for experimentation on their farms.

Livestock integration and intensification: While the livestock density in Malawi is very low, the project is exploring options for enhancing productivity across the interventions sites among the farmers who own livestock.

Zambia

Project sites:

Katete, Chipata, Lundazi districts in Eastern Province

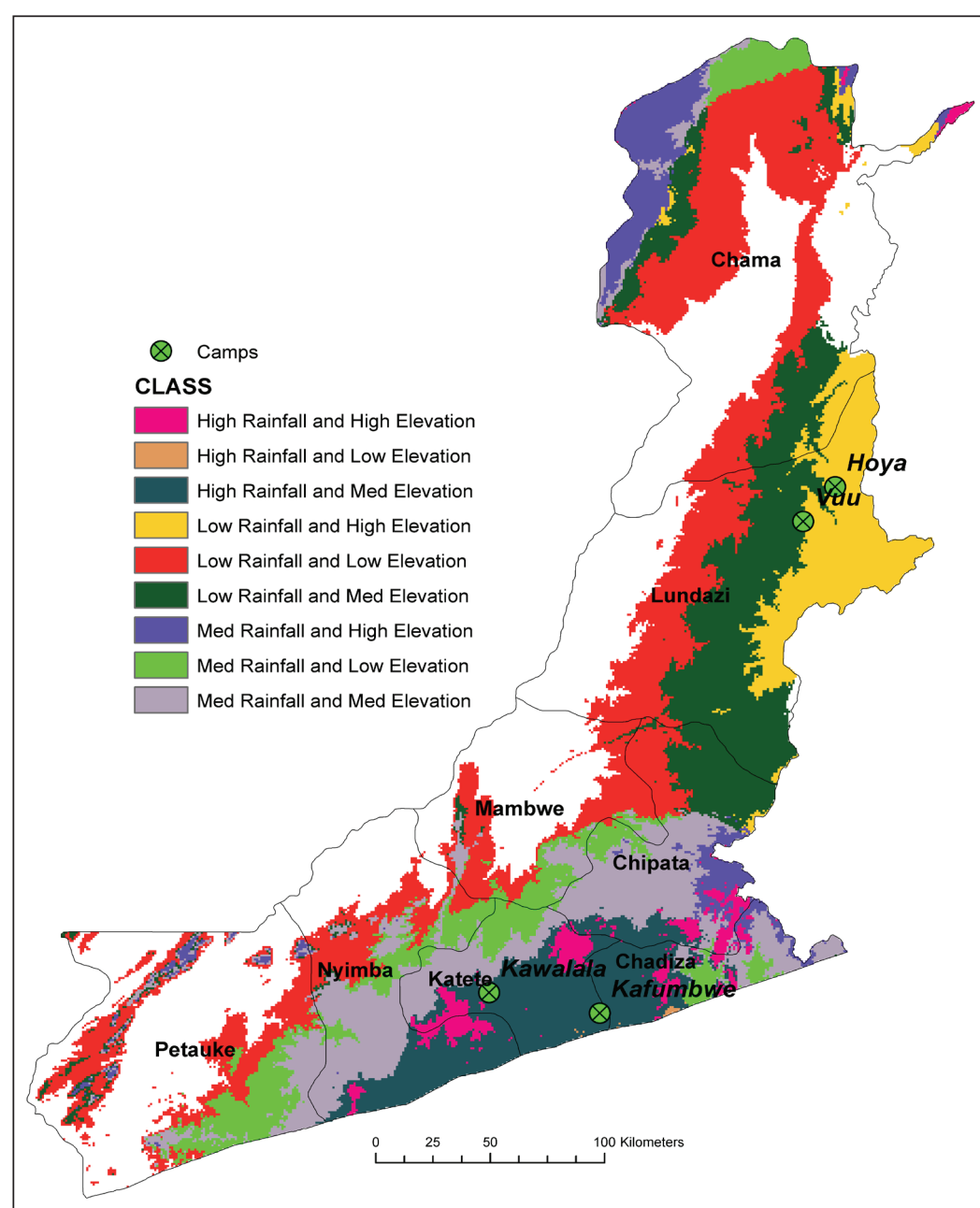
Challenges: low soil fertility conditions, frequent droughts, farmers can only make limited use of high yielding varieties and inorganic fertilizer, lack of capital and assets to invest in improved production methods.

Project interventions

Africa RISING has formed a strategic partnership with the SIMLEZA (Sustainable Intensification of Maize-Legume Systems in Eastern province of Zambia) project, led by the International Center for Tropical Agriculture (CIMMYT) and IITA.

The SIMLEZA-Africa RISING research activities aim at:

- Enhancing technology targeting and delivering for the poor by identifying systematic constraints and option for improving input and output value chains and impact pathways
- Enhancing the adoption and adaptation of productive and resilient agronomic practices and facilitation of local innovation systems for intensification and income growth in maize-legume cropping systems
- Enhancing the diversification of soybean use at household level through processing and product development
- Increasing the range of maize and legume varieties through participatory testing and release, and enhanced delivery of seeds of locally adapted varieties
- Enhancing the capacity of national partners on targeting, technology adaptation, trial management, seed and input supply and value chain development



SIMLEZA-Africa RISING Research Action Sites (camps) in Zambia

"Through this project we want to increase the productivity of smallholder farms while paying careful attention to avoid any negative environmental impacts and also address some of the challenges we are currently facing due to climate change. We want to use science to bring about a Green Revolution but avoid the negative consequences that are often overlooked."

Jerry Glover

USAID Senior Sustainable Agricultural Systems Advisor Africa

Partners

To implement the Africa RISING East and Southern Africa project, IITA has entered into partnerships with a wide range of individuals and institutions with different expertise. These are farmers and their organizations, international and national research institutes, national and international universities, ministries, development organizations and private sector companies.

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